

Consumer Conservation Handbook

A Publication of
The New Jersey
Division of the Ratepayer Advocate



James E. McGreevey
Governor



Seema M. Singh
Ratepayer Advocate

WHO IS THE RATEPAYER ADVOCATE?

The Division of the Ratepayer Advocate is an independent state agency directed by Ratepayer Advocate Seema M. Singh that represents the interests of all classes of utility consumers.

The Ratepayer Advocate serves as an active participant in every proceeding whenever New Jersey utilities and providers of essential services by electric, natural gas, telecommunications, cable TV, water, and wastewater companies seek changes in their rates or services.

The Ratepayer Advocate also represents consumers when long-range energy, water, and telecommunications policies are decided that will affect the delivery and costs of these services well into the future.

This *Consumer Conservation Handbook*, as well as additional information on this and other information on these essential services, can be found at the Division of Ratepayer Advocate's web site at <http://www.rpa.state.nj.us>

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State of New Jersey
OFFICE OF THE GOVERNOR

JAMES E. MCGREEVEY
GOVERNOR

November 14, 2003

Dear Friends,

Thank you for your interest in energy conservation, which can bring greater comfort to your home and greater saving to your wallet.

Whether it is lowering your thermostat, installing Energy Star appliances or simply rearranging your furniture, room by room, you can make a big difference. Most things can be done with little, if any, cost to you. In this handbook, you will find a wide array of ideas for reducing energy usage, from heating and cooling your home more efficiently, to the lighting and appliances you use.

Over time you will find that every little bit helps and that you are saving money by saving energy.

Our administration is working hard to make energy more affordable. Most recently we signed sweeping legislation that makes it easier for municipalities to purchase energy in bulk, bringing significant savings to customers, much the way you might purchase goods from a wholesale club or warehouse store.

My congratulations to Ratepayer Advocate Seema M. Singh and the staff of the Ratepayer Advocate for producing this handy guide, *Consumer Conservation Handbook*, that provides room-by-room guidance and conservation tips to winterize and summerize the home to help ratepayers use less energy and save more money on their monthly bills.

Today we continue looking for better ways to do things in the State of New Jersey. We are making progress, addressing real problems and providing tangible results.

Thank You.

With all good wishes,

A handwritten signature of James E. McGreevey in black ink, featuring a large, stylized 'J' and 'M'.

James E. McGreevey

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CHAPTER I

WHY CONSERVE?

What Does It Mean to Conserve Energy?

In its simplest terms, the conservation of energy means consuming less energy. It means changing your behavior by making energy smart choices. There are many energy conservation strategies available to help you use less energy so you can save more money. For example, you can take

- small, simple and inexpensive conservation actions—like turning off lights you don't need.
- bigger conservation actions—like performing a home energy audit to evaluate possible sources of energy loss in your home or apartment.
- advantage of technologies—like installing time-of-use and load-shaving meters to monitor and control energy consumption and costs.

Still another method of conservation is to use energy-efficient products in and for your home.

“CONSERVATION” is different from **“ENERGY EFFICIENCY.”** Energy efficiency means the ability to use less energy to produce the same result. For example, Energy Star appliances are energy efficient—they do exactly the same job as ordinary appliances (refrigeration, air conditioning), but use less energy.

Together, conservation and energy efficiency combine to reduce your energy consumption and your energy costs, while maintaining quality of service to our homes, offices and factories.

Energy efficiency and conservation also help to increase reliability by reducing the demand for energy, which can help reduce the potential for blackouts or brownouts on days of extreme heat.

Electricity and natural gas purchased on the spot market during periods of peak demand are the most expensive power your utility can buy. Those costs are passed through to you. *Reducing consumption through conservation can help keep your utility bills down during the critical (and costly) air conditioning and heating seasons.*

Conservation does not mean you have to sacrifice your family's life-style or your personal comfort. It does mean that you have to make choices.

As described by the Alliance to Save Energy, "energy efficiency is the quickest, cheapest, cleanest way to increase our natural gas and other energy supplies... Energy efficiency must be the foundation of our nation's energy policy... We will virtually never run out of energy efficiency. It is our nation's inexhaustible energy supply."

Why Does the Ratepayer Advocate Care?

The Division of the Ratepayer Advocate ("RPA") was created as an independent agency by an act of the New Jersey State Legislature to provide consumer protection to utility ratepayers. The RPA's mission is to represent all ratepayers (paying special attention to residential and small commercial ratepayers) when the utilities file with the New Jersey Board of Public Utilities (BPU) for a change in rates or services.

The RPA also participates in matters that come before the BPU concerning state energy policy. The Ratepayer Advocate files comments, hires expert consultants, and is a statutory intervenor when the utilities petition the BPU for rate changes. That means we participate in evidentiary hearings and provide testimony regarding the position of our office.

Simply put, as a consumer advocate, we represent you—the consumer.

Why Should I Conserve?

The cost of electricity and natural gas is rising.

Electric rates are increasing by as much as 25% while the price of natural gas is going up 8 to 12%, with another 10% increase

possible by the time the winter of 2003–2004 is over. There are a variety of reasons for rising energy costs. Some of the factors that have led to higher energy costs are beyond our direct control. But ratepayers do have control over how much energy we consume.



Your gas and electric bills will be less if you consume less.

The Ratepayer Advocate wants you, the consumer, to have as much control over your utility bills as possible. The most effective way to take control is through energy conservation. If you find ways to use less energy, your actions will have a direct effect on your utility bills. You have the power to control your bills by taking control of your energy consumption!

System reliability will improve.

When distributing electricity through the grid that serves their territories, the utilities must exactly match the supply that goes through the wires with the demand of their customers. This is not an easy thing to do! Any fluctuations or disturbances on the grid can have the effect of creating an unintended blackout, or the need for rolling blackouts or brownouts in order to re-balance the load. You may think that you as an individual don't have much of an effect on the system—but you, plus all of your friends and neighbors who

are also doing their best to conserve, will create a critical mass that can mean the difference between the lights going out and the lights staying on. *You* are part of the critical mass!

Benefits to all of New Jersey.

Electricity is generated in many different ways, but the most common way is by the burning of coal. Not only is burning coal harmful to the environment, but burning coal spews toxic fumes and chemical compounds into the air that we breathe. Much of our pollution here in New Jersey can be attributed to coal-fired electricity generation in southern Ohio, Indiana and Kentucky! Natural gas is cleaner but drilling for it is environmentally destructive, taking away wildlife habitat and taking away precious open space on land and on the ocean floor.

New Jersey is one of the most progressive states in the nation. We are a technology leader with a healthy business environment in which to work. Governor James E. McGreevey has brought important quality of life and health issues to the forefront of his Administration, including preservation of water quality and the Smart Growth initiative to preserve open space and farmland and re-direct development to urban areas. By increasing our awareness of conservation and our conservation efforts, we will continue the tradition of keeping New Jersey at the cutting edge of important national issues by taking control of our own energy consumption and reducing our dependence on foreign energy sources.

Conservation Doesn't Mean Deprivation!

Some people think that energy conservation means that you have to freeze, swelter, or sit in the dark. That is far from the



truth! You don't need to give up a lot in order to make a difference. You can put as much effort into conservation as you choose—like anything else, the more effort you put in, the greater your return will be.

You have the power to control your energy consumption!

To help you choose the best conservation strategies to reduce your bills, our office has put together the following ideas and tips so that you can start conserving energy and saving money on your bills today!

Seema M. Singh,
Director and Ratepayer Advocate
New Jersey Division of the Ratepayer Advocate



Chapter II

Tips For Saving Energy

Typical Home Appliance Energy Costs:*



Hair Dryer
\$.01 per 5-min. use



Portable Heater
\$.09 – \$.18 per hour



Incandescent Light Bulb
100 watts: \$.01 per hour

Equivalent Compact Fluorescent Bulb
27 watts: \$.01 per hour



Window Air Conditioner
\$.09 – \$.28 per hour



Central Air Conditioner
\$.48 – \$.66 per hour



Fan
\$.01 – \$.07 per hour



Color Television
\$.01 – \$.05 per hour



Stereo System
\$.01 – \$.03 per hour



Vacuum Cleaner
\$.05 – \$.09 per hour



Personal Computer
\$.01 – \$.02 per hour



Electric Oven
\$.30 – \$.60 per hour



Dishwasher
\$.08 – \$.08 per load
(Electricity for wash water: \$.37 per load)
(Gas for wash water: \$.10 per load)



Freezer
\$15.00 – \$30.00 or more per month

Electric Baseboard Heater
Smaller Home: \$35.00 – \$110.00 per month
Larger Home: \$114.00 – \$300.00 per month



Water Heater
Electric: \$20.00 – \$70.00 per month
Gas: \$7.00 – \$19.00 per month



Clothes Dryer
Electric: \$.30 – \$.60 per load
Gas: \$.10 – \$.16 per load

Microwave Oven
\$.01 – \$.03 per 10 min.



Electric Rangetop Burner
\$.07 – \$.30 per hour



Refrigerator (Frost-free)
16 cu ft: \$10.00 – \$18.00 per month
20 cu ft: \$12.00 – \$22.00 per month



Clothes Washer
\$.03 – \$.23 per load

*Source: Pacific Gas and Electric Company web site: www.pge.com

Room-By-Room Tips For Saving Energy

Energy is a vital issue in terms of affordable housing.

Did you know that U.S. families on an average spend close to \$1,300 a year on their home's energy bills?

Heating and cooling a home are the largest costs of housing after the monthly rent or mortgage payment. Saving energy can be a good way to lessen the strain on family finances and free up money for other uses.

There are hundreds of things you can do to make your home more energy efficient and cost effective, ranging from simple, free adjustments to major long-term investments. Which ones you should do in your home will depend on a number of factors—where you live, the size and style of your house, how efficient it already is, which direction it faces, and so on.

Saving Money Around The Home:

Take the Whole-House Approach

We will start with a simple Room-by-Room guide on smarter home energy use. In the next section, we will introduce you to Home Energy Audit, which involves taking slightly more sophisticated steps.



Reminder: The key to achieving the most energy savings is a whole-house energy efficiency plan. To take a whole-house approach, view your home as an energy system with inter-dependent parts.

Your heating system is not just a furnace. It's a heat-delivery system that starts at the furnace and delivers heat throughout your home using a network of ducts. You may have a top-of-the-line efficient furnace, but if the ducts leak and are uninsulated, and your walls, attic, windows and doors are uninsulated, your energy bills will remain high.

Taking a whole-house approach to saving energy ensures that dollars you invest in energy efficiency are wisely spent.

Attic

The attic is a major player in your home's energy efficiency. A few basic steps can help you keep your costs down.



- Ventilate the attic space. Homes built long ago may have little ventilation or original vents may have been blocked by later construction. Vents are needed both high and low in the attic space to promote good circulation for proper ventilation.
- Insulate the attic space. Insulation can be added as loose fill or from rolls. High efficiency building code standards show "R" value recommendations of R-30 in ceilings, R-16 in walls and R-19 over crawl spaces. The "R" value is a measure of how well insulation traps heat.
- Check the fit of your attic access door or pull-down stairs. Weather-strip and insulate the door where you can.
- If you're having a new roof installed, consider adding a ridge vent.



Bedroom

Part of a good night's sleep depends on a comfortable bedroom. You can still get all the comfort you want and cut back on energy use with these steps.

- Close heating vents or radiators in rooms you don't use. However, if you have a heat pump system, leave all doors and vents open to ensure proper airflow.
- Use draft guards at the bottom of any doors that open into un-airconditioned or unheated areas.
- Use ceiling fans for cooling.
- Lower your thermostat at night and use more blankets in the

winter. However, if you have a heat pump system, you'll save more on energy costs if you keep the thermostat on a comfortable setting day and night.

Family Room

The family room is a favorite hang-out. It is also a place where you can save energy.



- Keep your fireplace damper closed when there is no fire in the fireplace. If you have glass fireplace doors, keep them closed as well.
- Use fans instead of air conditioning for cooling whenever you can.
- Put on more layers of clothing to keep warm. You can take off a sweater when you are active, then put it back on when you are not.
- Turn off televisions sets, stereos and other electric appliances whenever you are not using them.
- Use draft guards at the bottom of doors that open into un-airconditioned or unheated areas.

Kitchen

While everyday chores like cooking, washing dishes and keeping foods cold are not large consumers of energy on their own, they do add up. Before you buy kitchen appliances, always look for **EnergyGuide** labels to compare energy efficiency and yearly operating costs with other appliances in the same category. Remember, appliances with a superior efficiency rating will usually cost more initially, but over the lifetime of the appliance, you will save on operating costs.



- Grime from cooking, smoking and dust can make a light bulb dirty, reducing the light it gives off. Inspect and clean bulbs regularly.

- Use stove exhaust fans that vent to the outdoors as little as possible during the winter to limit sending heated air outdoors.
- Run your garbage disposal with cold water instead of hot.

Dishwasher



- Studies show electric dishwashers use less hot water than washing and rinsing dishes by hand. When you purchase a dishwasher, look for one with a short or light cycle. They require fewer fills and less hot water. Some dishwashers use up to 40% less hot water per load, and others allow you to reduce the temperature setting on your water heater. Both can save you money.
- Check the condition of your dishwasher filter screen and clean or replace it when necessary.
- Save more energy by air drying your dishes and only running full loads.
- Washing dishes by hand may not save energy or money. In fact, you can probably save energy using the dishwasher since hand-washing usually requires more water.
- Take advantage of the energy saving control on many dishwashers. It turns off the heat during the drying cycle. Opening the dishwasher after the rinse cycle is another way to save energy.

Oven/Stove

- Don't open the oven door to check on food any more than necessary. Twenty-five percent of the heat escapes every time you do. Turn off the oven about 15 to 20 minutes before the end of the cooking time. The left-over heat will finish the job.
- Avoid cooking during the hottest times on a summer day. Cook outdoors when you can.

- Cook in oven-safe glass or ceramic pans when you can. They allow you to set your oven temperature 25 degrees lower than the recipe calls for.
- Keep pots and pans covered and use the right size pot or pan for the size of your stove's burner. Use properly fitted lids to hold the heat in.
- Begin a self-cleaning cycle while your oven is still hot from cooking.
- Do summer cooking in the evening so your home stays more comfortable during the day.
- Cook several dishes in the oven at the same time. Prepare double recipes when you can and freeze for future use. Re-heat with the microwave.
- Keep the door closed when broiling in a gas-stove to keep in high temperatures. The gas flames will consume smoke and grease.
- A microwave oven is an energy efficient alternative to a conventional electric oven. It cooks food more quickly, and it uses 70%-80% less electricity than a regular electric oven.
- Although often recommended, it's not really necessary to pre-heat the oven for foods with a cooking time over one hour.



Refrigerator

- Check the door seal on your refrigerator to see if it needs to be cleaned or replaced. A door leak allows cool air to escape, forcing your refrigerator to use more energy to keep food cold.
- Cleaning the condenser coils found in the back or bottom of the refrigerator will maximize its efficiency. A brush or vacuum can be used. Be sure to unplug the refrigerator before you start cleaning.



- Keep the refrigerator away from heating appliances (ovens and dishwashers), windows and heating ducts. Direct exposure to heat forces the unit to work harder and use more energy.



- When purchasing a new refrigerator consider a high-efficiency model. Compare yellow **EnergyGuide** labels and choose the unit that uses the least amount of electricity.
- A freezer's efficiency is increased by keeping its compartment full. Be careful not to block the fan that allows cold air to circulate.
- Even though automatic defrost refrigerators are convenient, their defrosting features use a lot of electricity. A manual defrost refrigerator typically uses 36% less energy.
- Check temperature settings for the most efficient appliance operation. Refrigerator temperature should be 36–38 degrees and freezer temperature should be 0–5 degrees.

Laundry Room

Ninety percent of the energy your clothes washer uses goes toward heating water. You can save energy dollars by using hot water only for heavily soiled laundry. Most laundry can be washed in warm water and lightly soiled loads can be washed in cold water. You can also save by using cold-water rinses for each load. The temperature of the water used during the rinse cycle will not make your clothes any cleaner.



- Run the washer only when you have a full load of laundry to save energy and water.
- If you have more than one load of clothes to dry, try to do each load immediately after the one before to use the heat left over from the previous cycle and increase the efficiency of the dryer.

- If you are in the market for a new clothes dryer, consider purchasing one with a “moisture sensing” device that shuts off automatically when your clothes are dry so the dryer doesn’t run longer than needed.
- You can reduce drying time and energy use by setting your timer carefully. Over-drying your clothes uses more energy than necessary.
- Drying heavy and light fabrics separately will also keep drying time to a minimum. Mixing different weight fabrics causes the dryer to run longer than necessary.

Remember to check the lint filter before each load. Lint buildup blocks air flow and lengthens drying time, costing you energy dollars.

**Here's What These Appliances
Cost You in Energy Usage***
(per month)

Clothes Washer
\$.03 – \$.23 per load

Clothes Dryer
Electric: \$.30 – \$.60 per load
Gas: \$.10 – \$.16 per load

*Source: Pacific Gas and Electric Company web site: www.pge.com

Lighting

One of the easiest and cheapest places to start saving energy is with lighting. Lighting accounts for about 10% – 15% of a home’s electric use.

Did you know that one 18-watt fluorescent bulb will last the same number of hours as 10 75-watt incandescents, resulting in a savings of up to \$80.00 over the life of the bulb?



- Turn off the lights!

Incandescent light should always be turned off when not in

use. Fluorescent lights work optimally when they are not turned off repeatedly, so only turn them off when you plan to be away for 30 minutes or more.

- Replace your most frequently used incandescent bulbs with compact fluorescent lights.

Start with the lights you leave on for long periods, such as those which illuminate front and back doors and porches and the bulbs outside and inside the garage. Then change the bulbs in your laundry, utility and storage rooms, basement, attic, and shed.



- Compact fluorescent light bulbs use only about one third as much electricity as standard incandescent light bulbs.

Although fluorescent bulbs are slightly less expensive, a compact fluorescent will easily pay for itself by lasting up to 10 times longer than regular bulbs and by using much less electricity. These bulbs now come in smaller sizes (called subcompacts) that fit into any lamp.

- If you prefer incandescent bulbs, try to use “energy saver” bulbs.

These bulbs use halogen gases that allow the filament to burn brighter while consuming less electricity.

- Replace outdoor lighting with motion-detector lighting.

Outdoor lights that are left on all night can add unnecessary costs to your power bill. Using a bulb or fixture with a motion detector solves this problem. Installing a new fixture may require some professional assistance, but it’s worth the cost.

- A lot of energy can be saved by matching as closely as possible light bulb wattage to lighting needs.

A high wattage reading light in a hallway or alcove is not energy efficient or useful. Keep this practice in mind for your outdoor fixtures too. Fixtures that cast their light downward help to

reduce the effects of light pollution and provide more light where you need it. Be mindful of the impact outdoor lighting can have on your neighbors and the environment.

- Consider using task lighting (lighting directed at a specific area) instead of overhead or general lighting, which may light unused areas of the room.

Savings in the cost of bulbs and energy can be made with an area of “task” lighting.

- Turn 3-way bulbs to lowest settings.
- Clean or repaint small rooms every year and larger rooms every 2 to 3 years. Dirt on surfaces reduces the amount of light they reflect.



- Use dimmers to reduce the wattage and output of light bulbs. Dimmers also significantly increase the life of incandescent bulbs.

Keeping lights and fixtures clean can improve efficiency as much as 20%. Take advantage of reflected light by keeping portable fixtures as close as possible to light colored walls or other surfaces.

These easy steps may reduce the number and wattage of bulbs you need and help you save on your electricity bills.



Windows

Windows can be one of your home's most attractive features. Windows provide views, daylight, ventilation, and solar heating in the winter.

Unfortunately, windows can also account for 10% to 25% of your heating bill.

- Did you know that during the summer, sunny windows can make your air conditioner work two to three times harder?
- Did you know in the winter an average window can lose six to 10 times as much heat as the same area of wall?

That's why proper installation of energy-efficient windows is such an excellent idea.

Here are some tips on improving or replacing your windows.

- ☐ Single-pane windows are the most inefficient, but it is possible to increase their efficiency. You can install storm windows to reduce air leaks and reduce heat loss by 25% to 50%. Storm windows should have weatherstripping at all moveable joints and be made of strong durable materials.
- ☐ Repair and weatherize your current storm windows, if necessary.
- ☐ Look for dirty spots around your window, which often indicate a hole where air leaks into your house.
- ☐ Install tight-fitting, insulating window shades on windows that feel drafty after weatherizing.
- ☐ In the winter, close your curtains and shades at night and open them during the day to let the sun warm the room.
- ☐ Low-cost options available for improving windows are caulking, weather stripping, retrofit window films and window treatments.
- ☐ Moveable insulation, such as insulating shades, shutters, and drapes can be used on the inside of windows to reduce heat loss in the winter and reduce heat gain in the summer. Shading devices such as awnings, exterior shutters, or screens can be used to reduce unwanted heat gain in the summer. In some cases, these window treatments are more cost-effective than energy efficient window replacements and should be considered first.
- ☐ Tinted glass and tinted window films have long been used in commercial buildings to reduce heat gain through windows. Improved, lightly tinted windows are becoming more common for homeowners. These new glazings reduce the solar heat gain without reducing visibility as much as older tinted glass and films.



HOME ENERGY AUDITS

Home Energy Audits*

A home energy audit will tell you how much energy your home consumes. It is the first step to evaluating what measures you can take to make your home more energy efficient. By pinpointing where your house is losing energy, an audit will identify where you can save significant amounts of money over time by correcting problems. Audits also determine the efficiency of your home's heating and cooling systems and show you how to conserve hot water.



You can perform a simple energy audit yourself or check with your utility to see if it offers audit services. You can also have a professional energy auditor carry out a more thorough audit. A professional auditor uses a variety of techniques and equipment to determine the energy efficiency of a structure. Thorough audits often use equipment such as blower doors, which measure the extent of leaks in the building envelope, as well as infrared cameras, which reveal hard-to-detect areas of air infiltration and missing insulation.

The following is a discussion of do-it-yourself as well as professional audits.

Do-It-Yourself Audits

You can conduct a basic home energy audit yourself. With a simple, but diligent "walk-through," you can spot many problems in any type of house. When auditing your home, keep a checklist of areas you have inspected and problems found. This will help you prioritize your energy efficiency upgrades.

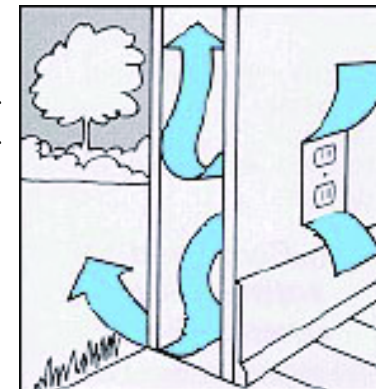
Locating Air Leaks

First, make a list of obvious air leaks — drafts. The potential energy savings from draft reduction may range from 5% to 30% per year, and the home is generally much more comfortable afterward.

* Information may be obtained from the U.S. Department of Energy web site at www.eere.energy.gov

Check:

- ☐ Indoor air leaks such as gaps along the baseboard or edge of the flooring and at junctures of the walls and ceiling;
- ☐ To see if air can flow through electrical outlets, switch plates, window frames, baseboards, weather-stripping around doors, fireplace dampers, attic hatches, and wall- or window-mounted air conditioners;
- ☐ Gaps around pipes and wires, electrical outlets, foundation seals, and mail slots;
- ☐ To see if the caulking and weather-stripping are applied properly (no gaps or cracks), and are in good condition;
- ☐ Windows and doors for air leaks. See if you can rattle them, since movement means possible air leaks. If you can see daylight around door and window frames, then the door or window leaks. You can usually seal these leaks by caulking or weather-stripping them;
- ☐ The storm windows to see if they fit and are not broken.



You may also wish to consider replacing your old windows and doors with newer, high-performance ones. If new factory-made doors or windows are too costly, you can install low-cost plastic sheets over the windows during the cold months.

On the outside of your house, inspect all areas where two different building materials meet. For example, inspect

- ☐ all exterior corners;
- ☐ where siding and chimneys meet;
- ☐ areas where the foundation and the bottom of exterior brick or siding meet.

You should plug and caulk holes or penetrations for faucets, pipes, electric outlets, and wiring.

Look for cracks and holes in the mortar, foundation, and siding, and seal them with the appropriate material.

Check the exterior caulking around doors and windows, and see whether exterior storm doors and primary doors seal tightly.

CAUTION: When sealing any home, you must always be aware of the danger of indoor air pollution and combustion appliance “backdrafts.”

Backdrafting is when the various combustion appliances and exhaust fans in the home compete for air. An exhaust fan may pull the combustion gases back into the living space. This can obviously create a very dangerous and unhealthy situation in the home.

Warning: In homes where a fuel is burned (*i.e.*, natural gas, fuel oil, propane, or wood) for heating, be certain the appliance has an adequate outside air supply. Generally, one square inch of vent opening is required for each 1,000 Btu of appliance input heat. When in doubt, contact your local utility company, energy professional, or ventilation contractor.

Insulation

Heat loss through the ceiling and walls in your home could be very great if the insulation levels are less than the recommended minimum.

Check to see if the level of the attic and wall insulation of your home is at least at the minimum recommended amount. When your house was built, the insulation recommended at that time was installed. Given today’s energy prices, and the likelihood that future prices will be higher, the level might be inadequate, especially if you have an older home.



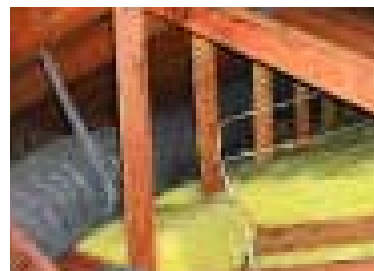
Attic

If the attic hatch is located above an air-conditioned space, check to see if it:

- ☐ Is at least as heavily insulated as the attic;
- ☐ Is weather stripped;
- ☐ Closes tightly.

In the attic, determine whether openings for items such as pipes, ductwork, and chimneys are sealed. Any gaps should be sealed with an expanding foam caulk or some other permanent sealant.

If you have recessed light fixtures, determine if they are IC rated fixtures which are designed for direct contact with insulation. It is strongly recommended that only air-tight IC rated fixtures be used. Other types allow large amounts of your heating dollars to escape into the attic.



If you do not wish to purchase new IC rated fixtures, be certain to allow a three-inch space around any recessed lights. This will prevent the recessed light from overheating.

While you are inspecting the attic, check to see if there is a vapor barrier (retarder) under the attic insulation. The vapor barrier might be tar paper, kraft paper attached to fiberglass batts, or a plastic sheet. If there does not appear to be a vapor barrier, you might consider painting the interior ceilings with vapor barrier paint. This reduces the amount of water vapor that can pass through the ceiling. Large amounts of moisture can reduce the effectiveness of insulation and promote structural damage.

Make sure that the attic vents are not blocked by insulation. You also should seal any electrical boxes in the ceiling with flexible caulk (from the living room side or attic side) and cover the entire attic floor with at least the recommended amount of insulation.



Basement

If your basement is unheated, determine whether there is insulation under the living area flooring. In most areas of the country, R-25 is the recommended minimum level of insulation. The insulation at the top of the foundation wall and first floor perimeter should have an R-Value of 19 or greater. If the basement is heated, the foundation walls should be insulated to at least R-19. Your water heater, hot water pipes, and furnace ducts should all be insulated.



Heating/Cooling Equipment

Inspect heating and cooling equipment annually, or as recommended by the manufacturer. If you have a forced air furnace, check your filters and replace them as needed. Generally, they should be changed about once every month or two, especially during periods of high usage. Have a professional check and clean your equipment once a year.

If the unit is more than 15 years old, you should consider replacing it with one of the newer, energy-efficient units. This would go far to reduce your energy consumption, especially if the existing equipment is in poor condition.

Check your ductwork for dirt streaks, especially near seams. These indicate air leaks, and they should be sealed with a duct mastic. Insulate any ducts or pipes that travel through unheated spaces. An insulation R-Value of 6 is the recommended minimum.



Lighting

Energy for lighting accounts for about 10%-15% of your electric bill.



Examine the wattage size of the light bulbs in your house. You may have 100-watt (or higher) bulbs where 60 or 75 watts would do.

You should also consider compact fluorescent lights for areas where lights are on for hours at a time. Retailers may offer rebates or other incentives for purchasing energy-efficient light bulbs.

Professional Energy Audits

All professional energy audits should, at a minimum, include a “walk-through” similar to the one above and a blower door test (*discussed below*). Most will also include a thermographic scan (*also discussed below*). Professional audits generally go into great detail. The auditor should do a room-by-room examination of the residence, as well as a thorough examination of past utility bills.

Before the auditor visits your house:

- Make a list of any existing problems such as condensation and uncomfortable or drafty rooms.
- Have copies or a summary of the home’s yearly energy bills. You can request this information from your utility.

The auditors use this information to establish what to look for during the audit.

The auditor first examines the outside of the home to determine the size of the house and its features (i.e., wall area, number and size of windows). The auditor then analyzes the occupants’ behavior:

- Is anyone home during working hours?
- What is the average thermostat setting for summer and winter?
- How many people live here?
- Is every room in use?

Your answers may help uncover some simple ways to reduce your household’s energy consumption.

Walk through your home with the auditors as they work, and ask questions. They may also use equipment to detect sources of energy loss, such as blower doors, infrared cameras, furnace efficiency meters, and surface thermometers.

Blower Door Tests

A blower door is a powerful fan that mounts into the frame of an exterior door. The fan pulls air out of the house, lowering the air pressure inside. The higher outside air pressure then flows in through all unsealed cracks and openings.

The auditors may use a smoke pencil to detect air leaks. These tests determine the air infiltration rate of a building.

Reasons for establishing the proper building tightness include:

- to reduce energy consumption due to air leakage;
- to avoid moisture condensation problems;
- to avoid uncomfortable drafts caused by cold air leaking in from the outdoors;
- to make sure that the home's air quality is not too contaminated by indoor air pollution.



There are two types of blower doors: “calibrated” and “uncalibrated.” It is important that auditors use a calibrated blower door. This type of blower door has several gauges that measure the amount of air pulled out of the house by the fan. Uncalibrated blower doors can locate leaks in homes, but provide no method for determining the overall tightness of a building. The calibrated blower door's data allows the auditor to quantify the actual amount of air leakage and the effectiveness of any air-sealing job.

Thermographic Inspection

Energy auditors may also use thermography—infrared scanning—to detect thermal defects and air leakage in building envelopes.

Thermography measures surface temperatures by using infrared video and still cameras. These tools see light that is in the heat spectrum. Images on the video or film record the temperature variations of the building's skin, ranging from white for warm regions to black for cooler areas. The resulting images help the auditor determine whether

insulation is needed. They also serve as a quality control tool, to ensure that insulation has been installed correctly.

A thermographic inspection can be either an interior or exterior survey. The auditor decides which method would give the best results depending on weather conditions.

Interior scans are more common, because warm air escaping from a building does not always move through the walls in a straight line. Heat loss detected in one area of the outside wall might originate at some other location on the inside of the wall. Also, it is harder to detect temperature differences on the outside surface of the building during windy weather. Because of this, interior surveys are generally more accurate, as they benefit from reduced air movement. Thermographic scans are also commonly used while the blower door is running. The blower door helps exaggerate air leaking through defects in the building shell. Such air leaks appear as black streaks in the infrared camera's viewfinder.

Most energy audits take from four to eight hours and cost between \$300 and \$500. Any retrofit work would, of course, cost additional money.

How to Find and Select an Energy Auditor?

There are several places where you can locate professional energy auditing services. Your local government energy or weatherization office may help you identify a local company or organization that performs audits. Here in New Jersey, you may contact the New Jersey Board of Public Utilities. Your electric or gas utility may conduct residential energy audits or recommend local auditors. Also check your telephone directory under headings beginning with the word “energy” for companies that perform residential energy audits.

Before contracting with an energy auditing company, you should take the following steps:

- Get at least five references, and contact all five. Ask if they were satisfied with the work.
- Call the Better Business Bureau and ask about any complaints against the company.
- Make sure the auditor uses a calibrated blower door.
- Make sure they do thermographic inspections or contract another company to conduct one.

* Source: Department of Energy web site at www.eere.energy.gov

HOW TO READ YOUR METER

Electric and Gas Meters

Our energy needs vary widely — by season, day of the week, even hour of the day.

This information about how to read your electric and gas meters will be useful in showing how to measure your consumption. It will give you greater control of your energy budget through an understanding of the ways your use of energy affects your monthly bill.

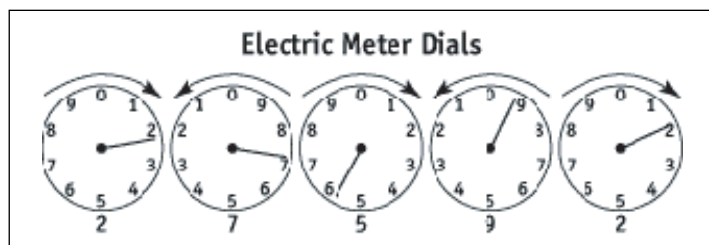
How Your Meters Measure Electricity and Gas

Your electric meter has either four or five dials that register the amount of electricity you have used in kilowatt-hours (kwh). Your gas meter will have either three or four dials that register the amount of gas you have used in Therms. The way both your electric and gas meters work is similar to the odometer in your car. When the hand on one dial makes a complete circle, the hand on the dial to its left moves up one number. As you can see in the diagram below, the hands and numbers on the dials run clockwise or counterclockwise.

Here Is How To Read Your Meter

To get the most precise reading, start with the dial on the right. Always record the number the hand has just passed (remembering that the dial might be going counter-clockwise) and not the number it is approaching.

In the example below, beginning with the right dial the hand is directly on the 2, so you would record 2. The next dial to the left has the hand between the 9 and 0, so you would record 9. Continue reading the remaining two or three dials this way.



Once you have recorded all of the numbers, you then read them from right to left.

In our example, the meter reads 29572. This is your current meter reading. To determine the amount of electricity you have used since the last time you recorded your meter reading, you would subtract your previous meter reading from the current reading.

For example, if your last reading was 28501, then the amount of kwh used is 1,071 kwh. Divide the kwh used by the number of days between readings to calculate the kwh per day. Remember, your gas meter works the same way.

Keep in mind that when the power company representative reads your meter, they do NOT set it back to zero. Therefore the dials keep turning until the next time the meter is read.

REMINDER

Tampering with an electric or gas meter to make it show less consumption, or bypassing the meter entirely, is illegal and dangerous. When someone uses electricity or gas without paying for it, others pay more.

CAULKING AND WEATHERSTRIPPING



Even if your home is well insulated, it is important to stop heat loss and eliminate drafts caused by air leaks.

If you added together all the small cracks, crevices and holes in your home, you might find they let in as much cold air in the winter as an open window. They also provide a route for warm air to escape.

Cracks or crevices that allow heated air to leak through and pass your home's insulation are known as bypasses. Bypasses are found in interior and exterior walls, vents, recessed light fixtures, plumbing and electric wire passages, stairways and the space around your chimney.

Finding air leaks

You can weatherize your home and substantially reduce air infiltration by caulking and weather-stripping. It only takes a few relatively inexpensive materials and some time, and the payback period is usually within one season.

The first step is to check for air leaks inside and outside your home. For the best results, do this on a cool windy day, or a very cold winter day, making sure that all exhaust fans, the furnace and the clothes dryer are running.

To detect air leakage, hold a smoking object such as an incense stick or a thin thread near doors, windows and vents. Thread or smoke movements made by air currents indicate drafts. Move the thread or smoke around window and door edges, electrical outlets and other possible sources of air leaks. Mark drafty spots with chalk. The following information will help you determine whether caulking or weather-stripping will work best to seal the leaks.



Caulking

Building materials found in your home such as wood and plaster will expand and contract with changes in temperature and moisture. As this happens, cracks and openings may occur in both interior and exterior walls. These areas either need to be caulked, or the current caulking may have hardened and need to be replaced.

Select caulk based on how well it will bond to the surface to which you are applying it. Below is a checklist of areas inside and out your home that should be caulked:

- Around door and window frames
- At the point between the foundation and the floor
- Cracks in brick or foundation
- Where chimney flashing meets the wood framing
- Around exterior openings including utility outlets, phone lines, outside plumbing faucets, vents and fans
- Openings around the chimney stack in the attic
- Where heating and/or air conditioning ducts pass through unfinished attics or basements
- Cracks where woodwork meets walls and floor
- Around a room air conditioner
- Between a porch and the main body of the house
- At corners formed by siding
- Openings around drain pipes in bathroom and kitchen
- Opening around the plumbing vent in the attic



Interior Cracks

Because humidity found in warm air can leak into the wall cavities and condense and cause damage, it is important to caulk on the inside of your home. You can caulk indoors at any time of year.

Exterior Cracks

Exterior cracks allow cold outside air to penetrate insulation and chill the inside of your walls. This resulting moisture can penetrate structural components and cause deterioration. Be sure to read the manufacturer's instructions on the recommended temperature for caulking application. Generally, the outside temperature should be at least 40° F for caulking to adhere correctly. For best results, plan to caulk during cool, dry weather.



CAULK TYPE	DURABILITY	APPLICATION
Rope or cord caulk	Temporary filler, 1 to 2 years	<ul style="list-style-type: none"> • Specialized product for filling in small gaps • Easy to apply and remove • Excellent seal
Oil/resin base	High quality, 5 to 10 years Low quality, 3 to 5 years	<ul style="list-style-type: none"> • Will bond to most surfaces • Very low elasticity • Forms a hard surface when dry • Solvent clean-up
Latex base	Up to 10 years	<ul style="list-style-type: none"> • May be applied to brick and wood • Will not bond to metal • Forms a hard surface when dry • Clean up with water
Butyl rubber	Up to 10 years	<ul style="list-style-type: none"> • Good adhesion to unpainted metal and masonry • Can be painted • Flexible when dry • High moisture resistance

CAULK TYPE	DURABILITY	APPLICATION
Silicone	20 years or more	<ul style="list-style-type: none"> • Excellent adhesion to most surfaces • High moisture resistance • Flexible when dry but can't be painted
Polyurethane	20 years	<ul style="list-style-type: none"> • Specialized product for large gaps • Difficult to apply • Excellent elasticity • Flammable — must be covered by a fire-retardant wall on interior
Polymeric foam	20 to 30 years or more	<ul style="list-style-type: none"> • Excellent adhesion to a wide variety of materials • Available in pressurized cylinder • Excellent for sealing sill plates, rough openings for doors and windows, and other large openings.*

Weather-stripping

Like caulking, weather-stripping is a low-cost way to cut energy costs. Unlike removable caulks, weather-stripping allows you to open and close your windows year-round without replacing sealing material. Weather-stripping is applied at joints where two surfaces meet and move relative to each other, such as windows and doors. Properly installed weather-stripping provides an airtight seal around doors and windows.

Tests show that tubular weather-stripping provides the best seal. However, if doors and windows will be used by children or anyone

*Source: CenterPoint Energy Minnegasco web site: minnegasco.CenterPointEnergy.com

who is disabled or elderly, use silicone or rubber strips because they require less pressure when closing doors and windows.

<u>MATERIAL</u>	<u>DURABILITY</u>	<u>APPLICATION</u>
Tape	Up to 1 year	<ul style="list-style-type: none"> • Use on windows or doors that will not be opened • Can dry out and loosen within one heating season
Felt	1 to 2 years	<ul style="list-style-type: none"> • Use on top or side of door or window frame • Use for sealing gaps of uniformly narrow width
Foam	1 to 2 years	<ul style="list-style-type: none"> • Use on friction free areas such as: <ul style="list-style-type: none"> – bottom of window sash – frame of trap door – frame of warped or loose-fitting door
Tubular gasket & vinyl tubing	5 years	<ul style="list-style-type: none"> • Can be used on windows or doors • Provides a moderate seal • Visible when installed
Thin metal strip	5 years or more	<ul style="list-style-type: none"> • Nail to top and sides of door jamb • Somewhat difficult to install²

*Source: CenterPoint Energy Minnegasco web site: minnegasco.CenterPointEnergy.com

HEATING AND COOLING TIPS

Heating Tips

Heating is the single biggest energy use in your home. Here are some steps you can take. Remember - a well-maintained heating system will hold down fuel costs and provide reliable comfort.

- Check the filters in your heating system monthly and replace or clean them when they become dirty.
- Have your heating system checked periodically by a licensed professional.
- Proper insulation in walls, ceilings and floors will significantly reduce the loss of heat to the outdoors. Insulation will pay for itself in fuel cost savings and home comfort.
- Storm windows and doors are big energy and money savers. They can reduce heating costs by as much as 15% by preventing warm air from escaping to the outside.
- Double glazed and thermopane windows or even clear plastic across windows can minimize heat escape.
- Put extra blankets on the bed and cuddle up.
- The many small openings in a home can add up to big heat losses. Caulking and weather-stripping cracks in the walls, floors, windows and doors will save fuel and money.
- Close your closet doors and the doors to rooms when they are not being used.
- Dry air makes you feel colder than moist air at the same temperature. Maintaining home humidity will produce personal comfort at a lower thermostat setting and save



money. Shallow pans of water on radiator tops or near warm air vents or a room humidifier will help raise humidity levels and save you money.

- Keep heating registers and air vents clear of obstacles.
- Roll up towels and put them at the bottom of doors to stop drafts.

Four Myths About Heating:

Myth: If you turn down your thermostat at night or when you are gone, you will use more energy to warm up the house again than what you saved.

Fact: You always save by turning down your thermostat no matter how long you will be gone. The one exception is an electric heat pump. When you turn it up in the morning, the electric back-up elements kick on to bring the house up to temperature faster. You can purchase a special setback thermostat that compensates for this and will provide savings.



Myth: You should leave your pilot light burning during the summer to keep moisture from accumulating in your heat exchanger and rusting it out.

Fact: When gas burns, it gives off a considerable amount of water vapor. Leaving the pilot burning can actually cause the heat exchange to rust more.

Myth: You can warm up the house faster if you turn the thermostat up to 75–80 degrees initially.

Fact: The house warms up at the same rate no matter what temperature you set the thermostat. Setting it higher can cause the furnace to overshoot the desired temperature, wasting energy.

Myth: Installing a ceiling fan on an eight-foot ceiling will keep warm air from accumulating near the ceiling and save considerable energy.

Fact: In you have a forced-air furnace and/or a tight, well-insulated house, there will be little if any difference in air temper-

ature from the floor to ceiling. Running a ceiling fan creates a draft that could cause you to turn up your thermostat to feel comfortable. The only exception might be a vaulted ceiling.

Water Heaters

- Reduce your water-heating bill by 10% by lowering the water heater temperature from 140 degrees Fahrenheit to 120 degrees Fahrenheit. Keep the temperature at 140 Fahrenheit if you use a dishwasher without a temperature booster.
- Once a year, drain a bucketful of water out of the bottom of the water heater tank. This gets rid of sediment, which can waste energy by “blocking” the water in the tank from the heating element.
- Consider buying a water heater insulation kit, which reduces the amount of heat lost through the walls of the tank.
- Insulate your hot water supply pipes to reduce heat loss. Hardware stores sell pipe insulation kits.



Cooling Tips

The onset of summer brings longer days and warmer temperatures—for many a welcome treat. But for others, the only thing that provides a source of comfort on those hot, sticky days and steamy nights besides a swim or an ice cream is an air conditioner.

Air conditioning is a major drain on energy, accounting for as much as half of summer energy bills.

By simply making sure that your cooling system is running efficiently, you could save yourself hundreds of dollars a year. Best of all, you don't have to sacrifice comfort to save on your cooling bills. In fact, you may actually be more comfortable once your system is working efficiently.

- Make sure your air conditioner is the proper size for the area you are cooling.



The wrong size air conditioner will use more electricity and increase your energy bills. A unit that is too large for a given area will cool the area too quickly, causing the air conditioner to frequently turn itself on and off. If a unit shuts off quickly, chances are it hasn't been running long enough to reduce the room's humidity and you will be uncomfortable. If your air conditioner is too small, it will run constantly on hot days without ever getting good results.

- The location of your air conditioner has a lot to do with how efficient it will be.

If you have a choice, locate your units on the north, east or the best shaded side of your home. If the unit is exposed to direct sunlight, it has to work much harder and use more energy to cool your home.

- Keep shrubbery away from your air conditioner since it blocks vents and reduces the unit's ability to exhaust air.
- Regular maintenance will ensure that your air conditioner operates efficiently throughout the summer.

Check the filter once a month by holding it up to a bright light. If you can't see through it, it's time to clean or replace the filter. You can also check your owner's guide to find out how to safely clean the condenser coils and fins on the outside of the unit.

- On very hot days, you can save energy by closing the fresh air intake on your unit.

Cooling fresh, warm outside air requires more electricity than re-cooling the air that is already circulating in your home.

- If you have central air conditioning, repair disconnected ductwork.

If a supply duct has worked loose from a vent or a connecting duct, the air from your cooling system never reaches the rooms in your house. It will spill into your home's attic or crawl spaces and eventually leak outside.

- You can save on cooling costs by avoiding cooling rooms that are not occupied.

If you like your home to be cool when you come home at the end of the day, special automatic timers for air conditioners are available that will turn the unit on before you arrive home.

- Depending on the size of your home, you can save 3% on your cooling costs for every degree you raise your thermostat in the summer.



Raising the thermostat from 73 to 78 degrees can mean savings of up to 15% in cooling costs.

- Fans make your air conditioner's job easier while saving you money.

Pedestal and ceiling fans improve the air circulation in your home, allowing you to raise the air conditioner's thermostat. In moderate heat, fans can sometime completely replace air conditioners.

- Turn off central air conditioning 30 minutes before you plan to leave your home.

The house will maintain a cool temperature for that time.

- Open windows and shades during the evening hours when it's cooler.

Use blinds, shades, and awnings to keep the heat out during daylight hours.

- Turn off lights, TVs and computers when they are not being used.

They make air conditioners work harder.

- To stay comfortable during the hottest hours of the day, do your cooking, laundry and bathing in the early morning or late evenings.

These activities all increase the level of humidity in your home, making it less comfortable and forcing the air conditioner to work even harder. If other heat generating appliances, such as irons, ovens and blow dryers are used only in the early morning or late evening, your home will stay cooler.

Try cooking with microwaves, slow cookers or crock pots that will not heat up a room as much as an oven. Barbecue whenever possible.

Landscaping

Landscaping is a natural and beautiful way to keep your home more comfortable. You may not realize it, but landscaping can also help reduce your energy bills. In addition to adding aesthetic value and environmental quality to your home, a well-placed tree, shrub or vine can deliver effective shade or act as a wind-break, thereby reducing overall energy bills.

Well-positioned trees can save up to 25% of a typical household's energy used for heating and cooling.

During the summer months, the most effective way to keep your home cool is to prevent the heat from building up in the first place. A primary source of heat buildup is sunlight absorbed by your home's roof, walls and windows. Dark-colored home exteriors absorb 70% to 90% of the radiant energy from the sun that strikes the home's surfaces.



Some of this absorbed energy ends up in your home by way of conduction, resulting in a warmer house, making your air conditioning work longer and harder. In contrast, light-colored surfaces effectively reflect most of the heat away from your home.

Landscaping can help block and absorb the sun's energy by providing shade and evaporative cooling. Shading and evaporative cooling from trees can reduce the air temperature around your home. Air temperatures can be 3 degrees to 6 degrees cooler in tree-shaded neighborhoods than in neighborhoods with few and small trees. These energy conserving landscape strategies will depend on the type of climate in which you live.

- Trees that lose their leaves in the fall (i.e., deciduous) are the most effective at reducing heating and cooling energy costs. When selectively placed around a house, they provide excellent protection from the summer sun but permit winter sunlight to reach and warm your house.
- Vines provide shading and cooling. Grown on a trellises, vines can shade windows or the entire side of a house.

Deflect winter winds by planting evergreen trees and shrubs on the north and west sides of your house; deflect warm summer winds by planting them on the south and west sides of your house.

Small Appliances

Many small appliances made today continue to draw power even when they are switched off.

Nearly 20 percent of the electricity used by appliances is lost while they are sitting in standby mode, waiting to be used. The biggest standby loss of energy, sometimes referred to as "leaking electricity," occurs in modern consumer electronics.

Even when your television is turned off, it's really in standby mode so that it can instantly respond to your remote control. Along with TVs, VCRs, cable boxes, and satellite dishes account for the largest share of a home's leaking electricity, roughly 35%.

Audio equipment makes up another 25% of standby losses; a small compact audio unit can draw 9 watts while it's ostensibly turned off. Communications equipment such as answering

machines, cordless phones, and fax machines are responsible for an additional 10% of home electricity losses.

It is estimated that the average American household constantly leaks about 50 watts of electricity. Right now, the only way for consumers to prevent some appliances from leaking electricity is to unplug them when they might not be in use for a long period of time.

A solution is to plug your television and sound system into a single power strip or surge protector. This will enable you to turn on and off the related consumer electronics simultaneously and avoid leaking electricity. It will also protect your expensive equipment from damage in the case of power interruptions or surges.

Computers and other Home Office Equipment

Electricity use for office equipment is growing faster than any other category of electricity use in the commercial buildings sector. This category includes computers, monitors, printers, fax machines, and copiers. Energy use by office equipment is expected to grow by as much as 500% in the next decade.

Computers at home also waste a lot of energy, but you can take measures to minimize this. First, understand that screen savers do not save electricity in computer monitors; they are meant to prevent phosphor “burn-in” on the screen. If you leave your computer and other office equipment on all the time, you are likely spending well over \$100 per year on electricity!

The best way to reduce your computer and monitor’s energy consumption is to turn it off when not in use. If your computer has a “sleep” mode, make sure that this feature is enabled. With sleep mode active, the computer will automatically convert to a low-energy mode when not in use, cutting energy usage to less than half. Knowing this, you may want to shorten the delay time before your monitor automatically goes into sleep mode.

Other energy saving ideas include “smart” power strips that sense your presence or absence and turn the attached equipment on and off accordingly. To protect your computer during a power curtailment, invest in Uninterruptible Power Supplies (UPS), which combine surge protectors and battery packs. These will run a computer for a short time and prevent the loss of information if the power goes out.

Energy Star*

The Energy Star Label

Now you can be a smart shopper and make the right choices to start saving energy and money.



The Energy Star Label was created by the U.S. Department of Energy and the U.S. Environmental Protection Agency. These agencies set the criteria to help consumers shop for large and small home appliances and identify the most energy efficient products on the market today.

You can be assured that the appliance with the EnergyGuide label is a high-performance product that will reduce the operating cost of that appliance or product every month during its lifetime.

The following guide will help you read and understand the Energy Star Ratings for each product.

Air Conditioners for your room

Look for the EnergyGuide label with an Energy Efficiency Ratio (“EER”) for room air conditioners. The higher the EER, the more efficient the unit is. Units with the Energy Star label are among the most energy-efficient products. Don’t forget to choose a size that is appropriate for the room.

What size to buy:

<i>Area in Square Feet</i>	<i>Btu/hour</i>
100 to 150	5,000
150 to 250	6,000
250 to 350	7,000
350 to 400	9,000
400 to 450	10,000
450 to 550	12,000
550 to 700	14,000
700 to 1,000	18,000

* Much of the information for this section was obtained from the U.S. Department of Energy web site at www.eren.doe.gov/conserinfo/energy_savers and the ESP Energy web site www.espenenergy.com

Central Air Conditioners

When looking for a central air unit, look for the EnergyGuide label with a Seasonal Energy Efficiency Rating (“SEER”) for central air conditioners. The Energy Star minimum efficiency level is 12 SEER.



Energy Star central air conditioners exceed federal standards by at least 20%.

You should contact a professional in your area for advice on sizing a central air system that best meets your needs.

Clothes Washing Machine

Look for the EnergyGuide label that will tell you how much electricity, in kilowatt hours (kWh), the clothes washer will use in one year. The smaller the number, the less energy it uses.

Energy Star clothes washers use less than 50% of the energy used by standard washers.

Look for design features such as water level controls that cut water usage. Other design features include a suds saver, spin cycle adjustment and large load capacity. Remember to use hot water only when you have to, as cold water washing saves the most energy.

Dishwashers

Look for the EnergyGuide label that will tell you how much electricity in kilowatt hours the dishwasher will use in one year. The smaller the number, the less energy it uses.

Look for features that will reduce water usage such as a booster heater setting and “smart” controls to control cycle type and time. Be sure to check how many gallons of water the dishwasher uses in different cycles. This will also reduce the cost to operate your dishwasher.



Programmable Thermostats

For maximum efficiency, thermostats should have at least two programs, four temperature settings, a hold feature that allows users to temporarily override settings, and the ability to maintain room temperature within 2 degrees Fahrenheit of the desired temperature.

Refrigerator and Freezers

Look for the EnergyGuide label that tells you how much electricity, (in kilowatt hours) the refrigerator or freezer will use in one year. The smaller the number, the less energy it uses.

Refrigerators with freezers on the bottom are more efficient than those with freezers on the side or on the top. Also look for heavy door hinges that create a tight door seal.



Water Heaters

Look for the EnergyGuide label that tells you how much energy the water heater uses in one year.

Look for the First Hour Rating (“FHR”) of the water heater. This measures the maximum hot water the heater will deliver in the first hour of use. If you typically need a lot of hot water at once, the FHR will be important to you.

Sizing is important when selecting a water heater. Your utility or appliance professional will be able to assist you in the proper choice of water heater for your needs.

Windows

Look for the National Fenestration Rating Council (“NFRC”) label that provides U-values and solar heat gain coefficient values. The lower the U-value, the better the insulation.

Check the climate region map of the Energy Star label to be sure that you have selected the window, door, or skylight that is appropriate for where you live.

Re-Energize Your Home: It Will Sell Quicker



If you are thinking of selling your home, your house will have to be in tip top shape to win the home buyer's interest. In today's market, where newer homes are raising the standards for energy efficiency, the competition is fierce. A great way to get an older home ready to sell is to make energy-saving alterations. Even if you decide to not sell, you will be glad that you took the time to improve your home.

The following tips will improve your home's safety and comfort, increase energy efficiency, and generally make your home more "sell-able" than a home without these improvements.

- **Install an energy-efficient sealed combustion furnace and a water heater with mechanical venting.** This will greatly reduce the danger of carbon monoxide backdrafting into your home and will reduce energy bills. Changing from an old furnace with 60 percent efficiency to one with 90 percent or higher efficiency will save 30 to 40% on your home's annual fuel costs.
- **Replace old appliances with Energy Star appliances.** Having an energy efficient refrigerator, dishwasher, and clothes washer can save you 30% on your energy bill compared to lower efficiency appliances.
- **Make sure that your kitchen and bathrooms have good ventilation fans.** This will ensure better indoor air quality and moisture control. Energy Star fans use 65 percent less energy and run quieter. Adding a programmable timer or humidistat control will help maintain ventilation without excessive energy use.
- **Seal your attic bypasses** (hidden air passageways leading to the attic), especially if your house is prone to icicles or ice dams in the winter. Properly sealing the bypasses will

eliminate hot spots on your roof that lead to ice dams and will reduce your energy bill.

- **Insulate your attic.** Combined with sealing attic bypasses, this relatively low-cost measure can add up to big savings on both heating and cooling costs.

In addition to these major improvements, there are simpler energy improvements that will show the home buyer that you pay attention to detail:

- **Install carbon monoxide and smoke detectors.** While not an energy saving measure, having these detectors sends the message that you care about safety and, it is two less things the home buyer will have to install.
- **Replace worn weatherstripping on all windows and doors.** It will improve comfort.
- **Install a programmable thermostat, compact fluorescent light bulbs in ceiling fixtures and a low-flow showerhead in bathrooms.** All of these items have greatly improved over the past few years and will help reduce your home's heating, electric and water bills.



Although many potential home buyers do not ask about energy efficiency, pointing out these features in your home will increase the attractiveness of your property.

CHAPTER IX

Natural Gas Tips

A Word About Natural Gas

Natural gas is one of the largest sources of energy for homes and businesses throughout the United States, and its popularity continues to grow. During the last decade, the use of natural gas in the United States has increased by 35% and is expected to grow by another 60% by 2020. About 87% of the natural gas consumed in the United States is produced within U.S. borders.



Environmentally, natural gas is an attractive fuel

Of every 100,000 Btus (British thermal units) of natural gas extracted from a gas well, 90,000 Btus reach the customer. Because we use natural gas in the same form in which it comes from the earth, it is a primary fuel. Natural gas requires no expensive, pollution-generating processing. Little energy is needed to carry it through underground pipelines. As a result, natural gas production is 90% efficient.

Electricity is a secondary fuel because it is produced from another energy source. Electricity is manufactured in a power plant where heat from water, coal, gas, oil or uranium produces steam to drive a turbine generator, which then produces electricity. Only 27%

of the converted energy reaches the consumer. That means that 73% of the energy generated is lost in production and transmission, making electricity comparatively far less efficient than natural gas.

Natural Gas Prices Have Increased

Wholesale natural gas prices are set in a competitive North American market and are subject to the market forces of supply and demand. When demand increases at a greater pace than production, prices rise. Demand for natural gas has been increasing, in part from the result of a cold winter and spring that depleted stored supplies, plus the increased use of natural gas for the generation of electricity. Low-cost natural gas supplies have been depleted and replacement supplies have cost more to produce. Therefore, utilities are paying more for supplies to meet their customers needs.*

Gas Conservation Tips

It is important for you to remember that, in addition to gas costs, weather dramatically affects your natural gas bills. When you use more fuel to heat your home during the cold-weather months, energy conservation becomes even more important. By following a few easy tips, you can save money on your gas bill.

Natural Gas Water Heater

A water heater is a thermostat-controlled storage tank that heats water and keeps it warm. It operates automatically when cold water is delivered to the bottom of the tank through the dip tube. The thermostat senses the cold water and calls for the burner to ignite. The burner brings the water to the preset temperature. The thermostat then shuts off the main burner until the stored water temperature again calls for heat.

- ☐ Set your water heater temperature to 120 degrees F or to the “warm” setting.
- ☐ Set your water heater temperature control to the pilot position when your home is vacant for two days or longer.
- ☐ A natural gas water heater typically has a substantially faster recovery rate than an electric water heater so you have the hot water you need, when you need it. The recovery rate is a

* Michigan Public Service Commission Consumer Alert, July 2003

combination of how much water is stored in the water heater and how quickly the water heater can heat the cold water to the preset temperature.

- ☐ Natural gas water heaters have about a 50% lower operating cost than electric water heaters.
- ☐ Keep the burner area free of dust and dirt.
- ☐ Wrap insulation on long stretches of pipe between your water heater and the point of use, and on pipes running through unheated areas.
- ☐ Install a water heater insulation wrap around the sides of the water heater. Never put insulation on the top or near the bottom of the heater.



A Typical Home Water Heater Uses This Much Energy (per month)

Electric:	\$20 – \$70
Gas:	\$7– \$19

Natural Gas Clothes Dryers

Natural gas provides a clean, efficient fuel for drying clothes economically. New gas dryers are designed for efficiency with features such as pilot-less ignition and automatic shutoff. Many new gas dryers use up to 30% less energy than older models.



- ☐ Vent the dryer to the outside in order to carry moisture-laden air out of your home. Flexible venting is not recommended, as it tends to obstruct airflow and collects lint in its grooves.
- ☐ Use the fast spin cycle of your washer to remove as much water as possible from your laundry before putting it in the dryer.
- ☐ Do not open the dryer door unnecessarily.
- ☐ Avoid overloading and over drying; these waste energy



Natural Gas Furnace

The furnace is the biggest guzzler of natural gas in most homes. If you are shopping for a new gas heating system, make sure you compare energy efficiencies and installation costs of various models. Also, look for models that are certified by the American Gas Association to ensure safety, reliability and efficiency.

There are several types of warm air heating systems or furnaces. The two main types are gravity systems and forced air systems. With a gravity system, heated air rises from the furnace through large supply ducts. Cool air returns to the furnace through cold air return ducts. The weight difference between warm and cool air keeps air circulating. A forced air system is where a blower forces warm air through supply ducts. Air enters the room though registers or diffusers and then returns via cold air duct to the furnace where it is filtered of dust and dirt particles, and then reheated and recirculated.

- ☐ Furnaces need periodic care to extend their operating life, save energy and increase efficiency. Make sure to follow all manufacturer's recommendations.
- ☐ Cleaning or adjusting a natural gas burner should be done by a qualified service person. If your heating system is not working properly, contact a professional.
- ☐ Allow heat to circulate freely. Once you have your furnace operating at peak performance, go through your home to make sure that heat is circulating properly. Move furniture, draperies and rugs that obstruct registers and heat vents.
- ☐ Keep radiators and registers dust free.
- ☐ Tightly shut exterior doors and avoid frequent in and out traffic.
- ☐ Your chimney is a great escape route for hot air, both from your fireplace and heating system. Close the damper tightly when you are not using the fireplace.

How Much Energy Do Natural Gas Appliances Use?

Besides being safe and clean, natural gas is one of the most cost efficient forms of energy. By effectively using your household gas appliances, you can save even more on your monthly natural gas bill.

The following chart lists the average amount of natural gas household appliances consume:



GAS APPLIANCE	THERM (TH) USE
Water Heater	6–8 TH, per person per month
Washing Machine [gas required for hot water (50 gallons)]	.33 TH per load
Dishwasher [gas required for hot water (15 gallons)]	.20 TH per load
Clothes Dryer	.17 TH per load
Range	.10 TH per meal
Oven	.20 TH per day
Oven (self-cleaning feature)	.50 TH per clean
Fireplace (35,000 Btu/hr)	.20 TH per hour
Barbecue (25,000 Btu/hr)	.25 TH per hour
Gas Yard Light	.50 TH per day
Furnace Pilot Light	4–12 TH per month

Note: A British Thermal Unit (“Btu”) is a measure of heat. One Btu is the quantity of heat needed to raise the temperature of one pound of water one degree Fahrenheit. One Therm of gas = 100,000 Btus. One kilowatt hour (AkWh”) = 3,412 Btus.

Source: Sierra Pacific web site: www.sierrapacific.com/services.energy/energy_tips

Water Conservation

Introduction

We seldom appreciate what is plentiful and easy to obtain. And what could be more plentiful than water? To get water, all we do is just turn on the tap, and it's there, 24/7, ready to be used. Right?



Think again — our water resources are not unlimited. They are affected every day by precipitation, population growth, economic development and pollution. Because water is a resource that must be shared. Competition for its use is an ever-increasing management problem. In the past, we tried to solve our supply problems by constructing storage facilities and developing new resources, such as wells and reservoirs. However, these measures can be both economically and environmentally costly.

Although water is the most common substance on our planet, 97% of it is seawater, unfit for human consumption. Of the 3% of water that is fresh, two-thirds is trapped in glaciers and ice caps at the poles. Believe it or not, just 1% of the entire water supply in the world is available for human use. Just this small percentage keeps all of the world's agricultural, manufacturing, and personal household and sanitation needs operating. We actually drink very

little of our processed “drinking water”— around 1% of all treated water. The rest goes on lawns, in washing machines, and down toilets and drains!

Water Conservation in New Jersey

The cost of clean water is on the rise. And, as demonstrated by the drought of 2002, an abundant supply of water is no longer guaranteed. Furthermore, in New Jersey, demand for water is on the rise and our water resources are constantly strained by the competing needs of the growing population, agriculture, industry, and recreation. In addition, pollution, declining water tables, and prolonged drought conditions are shrinking New Jersey's usable supply. As consumers, we need to reassess our water resources and water conservation activities.

Although water comes out of our taps and goes down our drains, it is a mistake to think that it's a one-way trip. In fact, water continually cycles through the environment, and both water treatment and water use rely on this cycle. When we think of water in this way, we can begin to appreciate the significance of water conservation on the natural environment. The less water we use or abuse, the less we degrade this valuable resource. Water conservation can ensure that the cycle will continue for us well into the future. In addition there are certain steps you can take to conserve water in and around your home and business.



Water conservation practices have the effect of increasing water-use efficiency which ultimately results in benefits to water utilities and their customers. Some of the benefits of conservation are reducing water demand during drought years, extending water supplies during other emergencies, saving energy and water cost reductions.

Is your water costing you more than it used to? Are you using more water than you thought? You'd be surprised how much you can save by water conservation. It not only will help save water, it will

also save you money. The following tips can help you live a more water-wise lifestyle.

Conserving Water in the Kitchen

Here are some steps that can add up to big water savings in the kitchen.

- Take foods out of the freezer early and place in the refrigerator to allow plenty of time for thawing. Thawing frozen goods under a running tap wastes water.
- Clean fruits and vegetables in a partially filled sink and rinse them quickly.
- Chill tap water in the refrigerator for drinking.
- Completely fill the dishwasher before you turn it on.
- Use ice trays in your freezer and turn off automatic ice makers.
- Never pour water down the drain if there is another use for it such as watering a plant or garden, or for cleaning around your home.
- When washing dishes by hand, fill one sink or basin with soapy water. Quickly rinse under a slow-moving stream from the faucet.
- Kitchen sink disposals require lots of water to operate properly. Start a compost pile as an alternate method of disposing food waste instead of using a garbage disposal.

Conserving Water in the Bathroom

The bathroom accounts for about 65% of the water used inside the home. Since we waste the most there, it is also the area where potential water savings are the biggest and the easiest to achieve.

- Men can save 10 to 20 gallons of water each time they shave by filling the basin instead of letting the water run continuously.
- Turn off the tap while brushing your teeth and use short bursts of water for rinsing.



- Install a high-pressure, low flow shower-head.
- A quick shower uses less hot water than a bath in a full tub. If you prefer a bath, don't overfill the tub; 1/3 full should be enough.
- Flush the toilet only when necessary. Never use it as a wastebasket.
- Bathe your young children together.
- Turn the water off while you shampoo and condition your hair and you will save more than 50 gallons a week.

Conserving Water In the Utility room

- An automatic clothes washer can use from 150 to 250 gallons of water for each cycle. This accounts for about 20% of total indoor water use. Cutting back on the amount of water you use for clothes washing takes planning; you can reduce water consumption and save on energy costs by planning ahead.
- When doing laundry, match the water level to the size of the load.
- Choose new water-saving appliances, like washing machines that save up to 20 gallons per load.

Other Water Conservation Tips

- Conserve water because it is the right thing to do. Conserve water even if someone else is footing the bill, such as when you are staying at a hotel.
- Encourage your friends and neighbors to be part of a water-conscious community.
- Pick up the phone and report significant water losses from broken pipes, open hydrants and errant sprinklers to the property owner or your water management district.
- Encourage your school system and local government to help

develop and promote a water conservation ethic among children and adults.

- Try to do one thing each day that will result in saving water. Each saving maybe minimal but every drop counts. You can make a difference!

Conserving Water Outdoors

Lawn & Garden

During the summer month, the biggest drains on water resources are lawns and gardens. It is not unusual to find that half or more of the water piped into your home is going right back out through hoses onto lawns and gardens. If you have a lawn and garden, the careful selection of the right plants, coupled with wise watering habits, can significantly reduce outdoor water use without affecting the beauty of your landscape.

- Don't over water your lawn. As a general rule, lawns only need watering every 5 to 7 days in the summer and every 10 to 14 days in the winter.
- Water lawns during the early morning hours when temperatures and wind speed are the lowest. This reduces losses from evaporation.
- Install sprinklers that are water efficient. Micro and drip irrigation and soaker hoses are examples of water efficient methods of irrigation.
- Raise the lawn mower blade to at least three inches. A lawn cut higher encourages grass roots to grow deeper, shades the root system and holds soil moisture better than a closely clipped lawn.
- Mulch to retain moisture in the soil. Mulching also helps to control weeds that compete with plants for water.
- Grow grass only in those areas where it provides functional benefit. Whenever possible substitute less water-demanding materials such as ground covers, rocks, and wood to enhance your yard.

Other Outdoor Conservation Tips

- Use a broom instead of a hose to clean your driveway or sidewalk and save up to 80 gallons of water every time.
- Periodically check your pool for leaks if you have an automatic refilling device.
- When the kids want to cool off, use the sprinkler in an area where your lawn needs it the most.
- Wash your car on the grass. This will water your lawn at the same time
- Avoid the installation of ornamental water features such as fountains unless the water is recycled.
- Do not leave sprinklers or hoses unattended. Your garden hoses can pour out 600 gallons or more in only a few hours.

HOW MUCH WATER IS LEAKING?

A dripping faucet is more than annoying, it's expensive. Small leaks waste significant amounts of water. Furthermore, a hot water leak not only wastes water but also the energy needed to heat the water. Some water leaks such as a dripping faucet are obvious. Other water leaks can be virtually invisible, such as a leaky toilet flapper valve or a leaky irrigation pipe in your yard. By following the advice in this handbook, you will be able to conserve water while you help keep your pipes, plumbing fixtures and water-using appliances in top shape.

FAUCET LEAK

60 Drops per minute = 192 gallons wasted per month
90 Drops per minute = 310 gallons wasted per month
120 Drops per minute = 429 gallons wasted per month

Source: California Urban Water Conservation Council

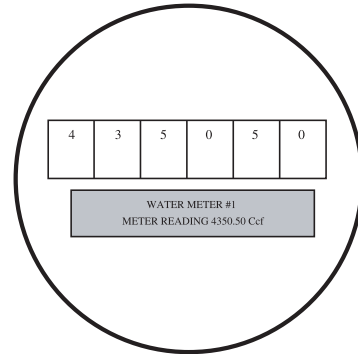
Water Meters and Leak Detection

Learning to read a water meter can help you monitor water

usage and review your utility bill for accuracy. More importantly, your water meter is a valuable tool in determining whether you have any water leaks. Water meters are usually located either in the basement, in a concrete box along the front curb or along an outside wall to your house. Most meters are read manually by an employee of your water utility. **Employees of your water utility are required to wear photo identification badges. Always ask to see an employee's identification before allowing an employee in your home.**

There are two main types of water meters in use today. Both record water usage in units of cubic feet (Ccf) or gallons.

Water Meter #1 looks like an odometer and is read in the same way an odometer is read in your car, left to right. To determine your monthly water usage, write down the meter reading on a specific date. Take



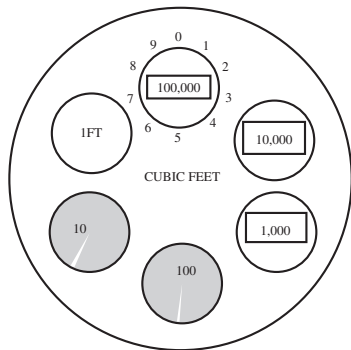
another reading exactly 30 days later. Subtract the old reading from the new reading and you will have the number of water units your household has consumed in 30 days.

Water Meter #2 looks like a set of small clocks, each with one pointer hand. These clocks turn either clockwise or counter clockwise. To determine water usage, start at the first clock with the highest cubic feet rating, *i.e.*, 100,000.

Write down the number the pointer hand points to on the first clock. If the pointer hand is between two numbers, write down the number to the left of the pointer hand. Proceed to the next lower clock and repeat procedure until all clocks are read.

As with meter #1, take a reading and repeat in 30 days. Subtract the old reading from the new one and you will have your water usage for that period.

Modern technology now permits automatic meter reading in some areas. Meters can be read from either a touch pad or over a tele-



phone line, so that you won't have to wait for a meter reader and you will get an actual reading every time.

Unmetered Water

If your water use is not metered, you must determine your water use for each fixture. Flow rates for showers and faucets can be measured by using a container and watch to determine the amount of water discharged through the fitting in a minute. Toilet use per flush can be approximated by measuring the volume of water inside the toilet tank (width x length x height) and dividing by 231. (There are 231 cubic inches in a gallon of water.) After you have determined the water use of each fixture, you will need to record the number of uses and the length of time each fixture is used to determine your average daily water use. Remember to estimate the amount of water used by appliances such as clothes washers and dishwashers as well as home water treatment systems.

Master Valves & Shutoff Valves

The master water supply valve controls the water supply to your home. It is a good idea to know where your master water valve is located, so you can turn off the water supply in the event of a major leak or as needed when making a plumbing repair.

The two most common locations for the master supply valve are next to the water meter or where the water supply pipe enters your home. To shut off the water supply, slowly turn the handle clockwise. (Many water supply valves require a special two-pronged "key" to turn the handle. Water supply keys can be purchased at most plumbing, hardware and home improvement stores.)



Plumbing codes now also require new houses to have a main shutoff valve inside the house. The valve can be located under any plumbing fixture, but the most common location is next to the water heater.

To make sure that the master valve has indeed shut off the water, turn on a faucet. If water flows the master valve has not completely shut off the water.

Most homes also have shutoff valves for the water lines that

run to individual water fixtures. For example, the shutoff valve for a toilet is located below the toilet tank. The shutoff valves for a kitchen or bathroom faucet are located under the sink. The typical faucet or toilet shutoff valve has an oval handle. Turn the handle clockwise to turn off the water supply.

FINDING AND FIXING INDOOR LEAKS

Toilets

How much water your toilet uses depends on two factors; its tank size and its working condition. Since 1992, federal law has mandated that all new toilets use no more than 1.6 gallons per flush. If your toilet is a 3.5 gallon-per flush model from the 1980's or an even older model that uses five or more gallons per flush, consider replacing your old water guzzler with a sleek new water conserving 1.6 gallon unit.

But even the new low flush toilets can be water wasters. A leaky flapper valve or an improperly set water level in the tank can cause significant water leakage. And remember, not every running toilet will make noise.

Even though you may think that your toilet is not leaking, there is one way to find out. Lift the lid off the toilet tank and put 10–15 drops of dark-colored food dye in the tank. After 15 minutes, check the toilet bowl for any signs of dye color. If there is color in your bowl, your toilet is leaking!

Leaks and noises are the most common problems with tank toilets, and the two types of problems are often related. The good news is that many common toilet leaks can be fixed by making minor adjustments.

If your toilet runs all the time the culprit may be an improperly adjusted float ball that results in the water level in the tank that's so high that the water is escaping into the top of the overflow pipe. A running toilet can also be caused by a cracked float ball, an improperly seated flapper or tank ball, a kinked lift chain or a bent lift wire.



Faucets

A dripping faucet is more than annoying, it is expensive. A leaky faucet is a common household water waster. A steady drip at the rate of one drop per second wastes 192 gallons of water a month. There are two types of faucets. The first type includes compression faucets which have two handles, one for hot water and one for cold water. The other type of faucet is the washerless faucet. These typically have just one handle that controls both the hot and the cold water. Washerless faucets are known for providing years of trouble free service because their design minimizes friction and wear.



The flow rate of a faucet is measured in gallons per minute (gpm). Older kitchen and bathroom faucets can have a maximum flow rate of 3 to 7 gpm. Since 1992, the maximum allowable flow rate is 2.5 gpm. Remember, no matter the flow rate of your faucet, leaving the tap running is a most wasteful practice.

Most indoor faucets have an aerator at the tip of the faucet spout. An aerator is a screw on attachment with a small wire screen that mixes tiny air bubbles into the water to create a smooth flow. A faucet aerator is an inexpensive and efficient water conservation device because it reduces water flow with no apparent reduction in pressure or volume.

Dishwasher

In recent years, dishwasher manufactures have made impressive strides in making their machines more water efficient. Some new water efficient models use less than 5 gallons per load on the normal wash setting. Older dishwashers may use up to 15 gallons per load.

Although dishwasher leaks are uncommon, there are a few possible types of leaks. If water leaks from the door, the likely culprit is the rubber gasket around the door. If the gasket has cracked or become hard and brittle with age, replace it with a new gasket.

Drought Emergency Lifted: *Water Conservation Still Essential*

On January 8, 2003, Governor James E. McGreevey lifted the statewide drought emergency that had been in place since March 5, 2002 when a parched New Jersey has just come through its driest period in more than 100 years. Water use restrictions imposed by the state in March 2002, including a ban on watering lawns, were relaxed in June 2002 after a wet spring, but were reinstated after a parched July and August 2002. Before the heavy rains came in the fall of 2002, New Jersey had just experienced its driest period in more than 100 years. The 16 inches of rain that fell during the unusually soggy fall were enough to boost northern reservoirs to well above the norm for January 2003.

In lifting the drought emergency, Governor McGreevey announced that “the short-term crisis is over, but the long-term threat remains.” Governor McGreevey also asked all New Jerseyans to work together to protect our waterways, to end crisis-to-crisis management of our most precious resource and to stop the over-development and sprawl that threaten to destroy New Jersey’s water supplies and quality of life.

In January 2003, after the drought emergency was lifted, New Jersey remained under a drought warning because underground well supplies in South Jersey were still below average. The drought warning also gave officials the authority to block construction that would affect water supplies. However, due to the significant amounts of snow that fell in the beginning of 2003, and on March 21, 2003 the drought warning was lifted. As of July 2003, no statewide water use restrictions are in effect.

To protect our water supplies against future water shortages, all consumers must be better stewards of water resources to ensure that there will be safe and reliable water supplies for the State’s growing communities and for future generations.

NEW WATER INITIATIVES OF THE MCGREEVEY ADMINISTRATION

A key environmental priority of the McGreevey Administration has been a focused effort to strengthen the protection of New Jersey’s water resources. The drought emergency in 2002 was the worst drought in state history. It was one of a series of recurring drought emergencies over the past several years, and highlighted the need to protect water resources even in a relatively water-rich state like New Jersey.

Protecting water resources in New Jersey today will require strengthened protection of high-quality waters, greater incentives for water reuse and recycling, recovery on thousands of claims for natural resource injury to groundwater resources, and long-term changes in water use practices. The two necessary initial steps toward improved protection of water resources are the expansion of the water quality anti-degradation policy and the move to set aside more open space.

Under the first initiative established in 2003, the New Jersey Department of Environmental Protection (NJDEP’s) highest water quality protections standard has been extended to drinking water supplies for the first time. The protection is called a “Category One” (C1) designation, and prevents any measurable deterioration in existing water quality. The C1 designation limits the impact that developments are permitted to have on the designated water bodies and waterways. A significant aspect of the C1 classification is a strict limit on discharges. While the state’s previous C1 designations were primarily extended to trout production streams, protection of these water bodies represents the first significant effort to safeguard high-quality drinking water supplies.

In April 2003, the Governor signed rules strengthening protection for nine major drinking water reservoirs and six ecologically sensitive river and stream segments. The nine reservoirs provide drinking water to approximately 3.5 million residents, or more than 40% of the state's population. May 2003 was proclaimed Watershed Awareness month by Governor McGreevey. On October 7, 2003, his administration announced that 12 more ecologically sensitive stream segments and tributaries in the Delaware River Watershed as well as three streams and rivers and two lakes in the Raritan and Hackensack Watersheds would receive the same high protection. In announcing the new designations, Governor McGreevey stated that "[T]he water our children drink deserves the same protection as the water where our fish swim.... Before protections were put in place, developers and industry could literally build right on top of our state's reservoirs and streams."

Another essential clean water initiative of the McGreevey Administration is Public Question No. 1 on the November 4, 2003 ballot. If approved, Public Question No. 1 will allow the Garden State Preservation Trust to issue an additional \$150 million in bonds for the preservation of open space and drinking water in the Highlands, among other initiatives. The preservation of open space goes hand in hand with the C1 classifications, as the two strategies move development away from high quality water supplies and channel it into areas more beneficial to the state's health and sustainable development.

For more information on these and other water protection related topics, please consult the NJDEP web site at www.state.nj.us/dep.



The Amount of Water We Use in Our Homes Varies During the Day

- **Lowest rate of water use:** 11:30 p.m. to 5:00 a.m.
- **Sharp rise/high use:** 5:00 a.m. to Noon.
(Peak hourly use from 7:00 a.m. to 8:00 a.m.)
- **Moderate use:** Noon to 5:00 p.m.
(Lull around 3:00 p.m.)
- **Increasing evening use:** 5:00 p.m. to 11:00 p.m.
(Second minor peak, 6:00 p.m. to 8:00 p.m.)
- **Compared With Other Countries, the United States Uses the Most Water Per Person (per capita)**

This is true even when compared with other countries that are equally well developed. In the United States, significant amounts of water are used for lawn and garden sprinkling, automobile washing, kitchen and laundry appliances, such as garbage disposals, clothes washers, and automatic dish washers.

Country	Annual Water Use Per Capita in Gallons	% of Use for Residential Needs	% of Use for Industrial/Agriculture Needs
United States	525,000	10	90
Canada	310,000	13	87
Belgium	221,000	6	94
India	132,000	3	97
China	122,000	6	94
Poland	112,000	14	86
Nicaragua	72,000	18	82
Malta	16,000	100	0

Source: Van Der Leeden, F., F.L. Troise, and D.K. Todd. *The Water Encyclopedia*, Lewis Publishers, Inc., Second Ed. (1990).

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New Jersey Division of the Ratepayer Advocate

Consumer's Bill of Rights

- All consumers must have access to reliable, safe, and affordable energy, telecommunications, and water services.
- All consumers, including low-income consumers, must be ensured affordable energy, telecommunications and water services through appropriate state and federal policies.
- All consumers must receive the benefits of new services, technological advances, improved efficiency and competitive prices.
- All providers of electric, gas, telecommunications and water services must be required to hold a license as a condition of doing business in New Jersey, and appropriate financial, operational, bond or other requirements must be established and enforced.
- Standards for protecting consumers in matters such as deposit and credit requirements, service denials and terminations, and deferred payment provisions must be applied to all service providers.
- All consumers must be protected from anticompetitive practices of providers of electric, gas, and telecommunications services.
- All consumers must be protected from price increases resulting from inequitable cost shifting.
- Sufficient enforcement resources must be provided to ensure that consumers receive the benefits of this Bill of Rights.
- All consumers must be protected from unfair, deceptive, unconscionable, and fraudulent practices on the part of any provider of electric, gas, or telecommunications services, including practices such as slamming, cramming, pyramid schemes, and deceptive information regarding pricing and terms and conditions of service.
- All consumers must be given unbiased, accurate, and understandable information concerning the price and terms of service, and in a form that allows simple price and term comparisons. This information must include disclosures about the generation resource mix, the environmental characteristics of their energy purchases, and the safety of potable water supplies.
- All consumers are entitled to protection of their privacy and must be protected from use of consumer records or payment history without their express, informed consent.
- All consumers must have access to an independent administrative process that provides a simple, quick, and effective means of resolving complaints about service and bills from all utility service providers.
- Standards must be established to ensure quality safe service, so that all consumers will receive quality service, including high levels of customer services.